



Formal drawings ppped 2/25/02

Attorney Docket No: B1034/7003

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):

John S. Thompson and Andrew M. Bird

Serial No:

09/727,390

Filing Date:

November 30, 2000

For:

METHOD AND APPARATUS FOR SIMULATING THE

MEASUREMENT OF A PART WITHOUT USING A PHYSICAL

MEASUREMENT SYSTEM

Examiner:

Unassigned

Art Unit:

2123

Attn: Official Draftsperson
Commissioner for Patents

Washington, DC 20231

## CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8(a)

I hereby certify that this document is being placed in the United States mail with first-class postage attached, addressed to the Commissioner for Patents, Washington, D.C. 20231 on the 28th day of January, 2002.

Gary S. Engelson

## LETTER TO OFFICIAL DRAFTSPERSON

Sir:

Subject to the approval of the Examiner in this case, enclosed for filing are twenty (20) sheets of FORMAL DRAWINGS, Figures 1 through 18, for the above-referenced patent application.

The Commissioner is hereby authorized to charge any fees which may be required to Deposit Account No. 23-2825. A duplicate of this sheet is enclosed.

Respectfully submitted,

John S. Thompson et al., Applicants

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Docket No.: B1034/7003 Date: January 28, 2002

xNDD

11/13/00

Load measuring system configuration and create virtual inspection system environment

-102

Open CAD model(s) for the part(s)

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Position the CAD part(s) inside the virtual inspection system environment:

- x: x-position
- y: y-position
- z: z-position
- $\alpha$ : x-axis position
- $\beta$ : y-axis position
- $\gamma$ : z axis position

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## CAD Camera

Generate 2D image from CAD model(s) by a rendering process according to the following parameters:

- 1. Camera Field of View (FOV) size and orientation
- 2. Optical magnification
- 3. Optical Depth of Focus\*
- 4. Position of part(s) within virtual inspection system environment  $-x,y,z,\alpha,\beta,\gamma$
- 5. Part(s) surface color
- 6. Part(s) surface texture properties
- 7. Number of light sources
- 8. Light source intensity
- 9. Light source direction
- 10. Light source illumination structure
- 11. Light source color

\*if necessary

FIG. 1A FIG. 1B



FIG. 1A

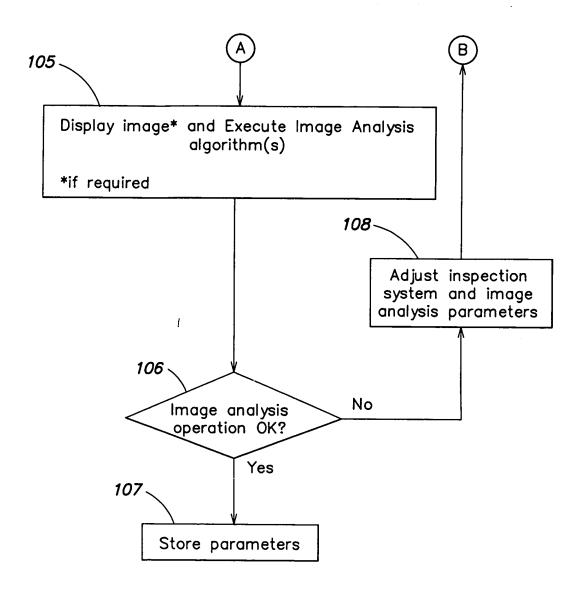


FIG. 1B

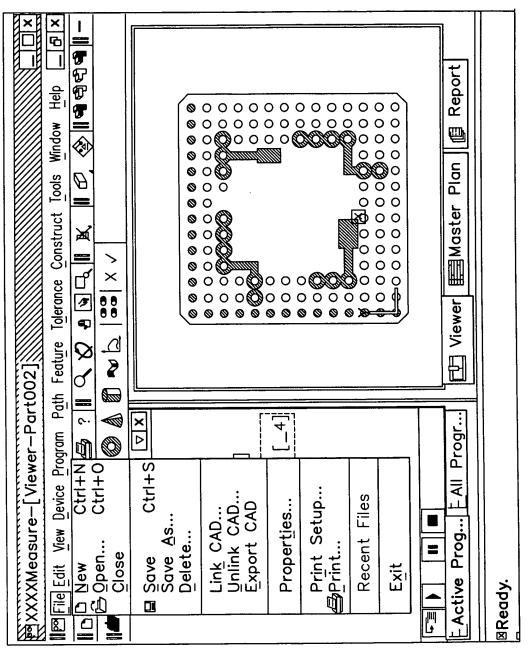


FIG. 2

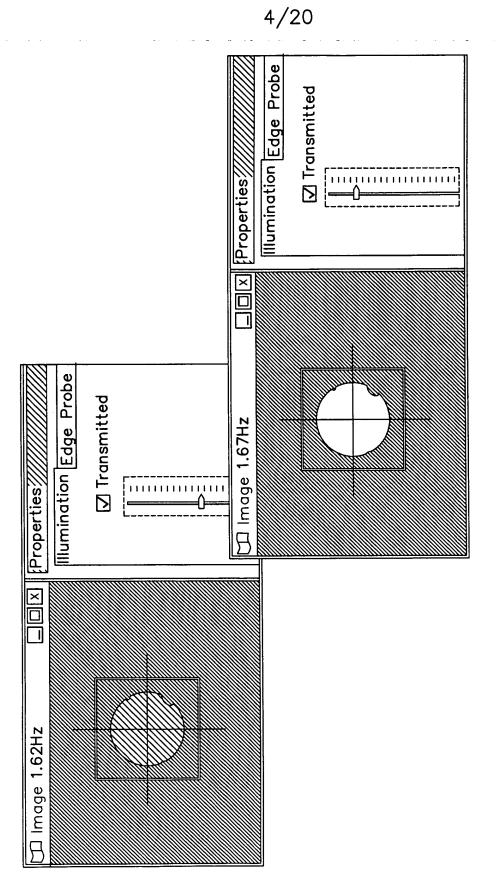


FIG. 3

FIG. 4

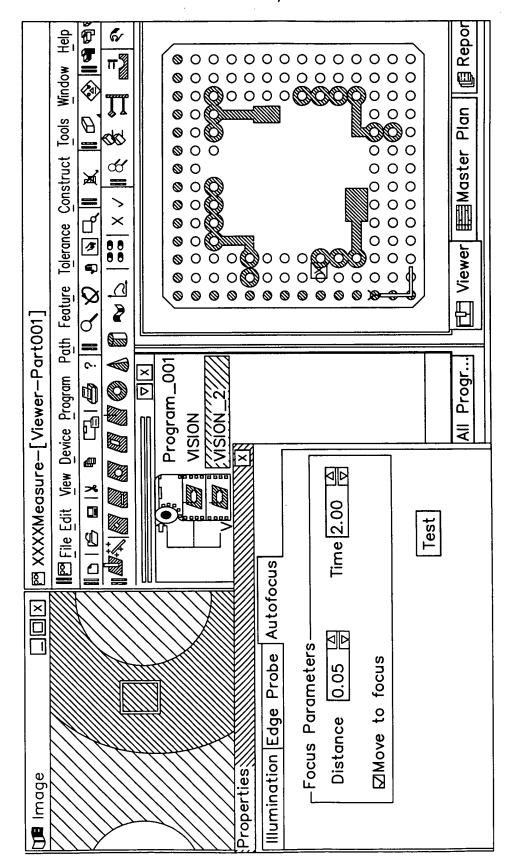
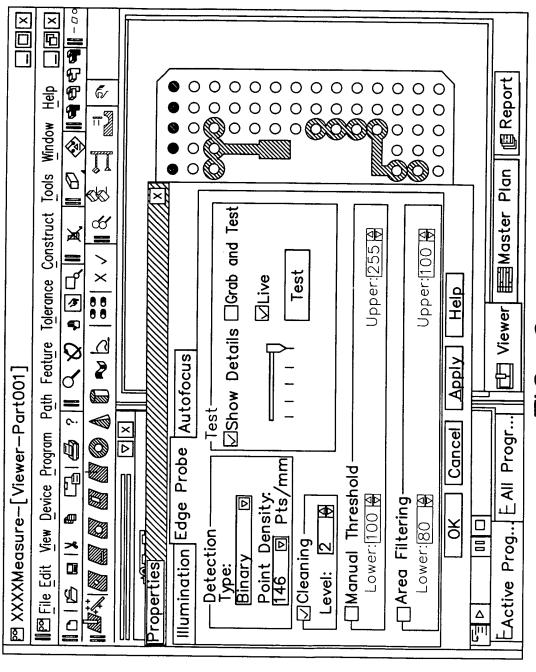
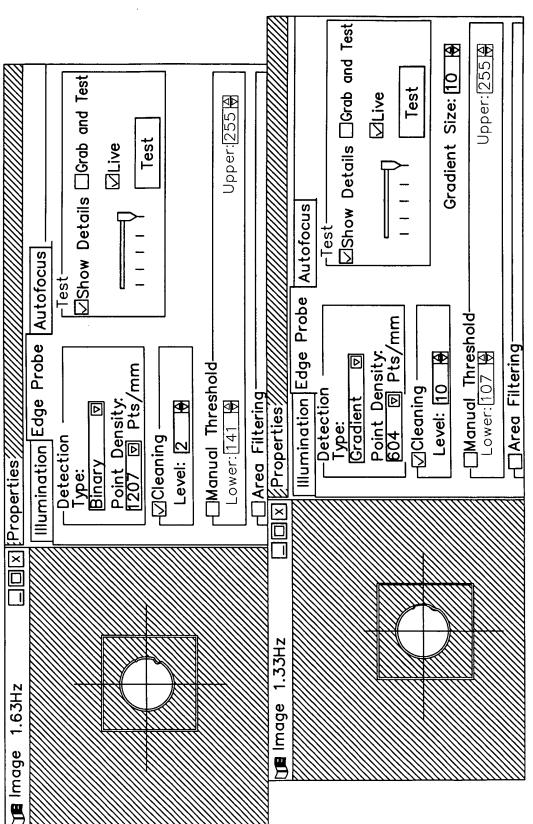


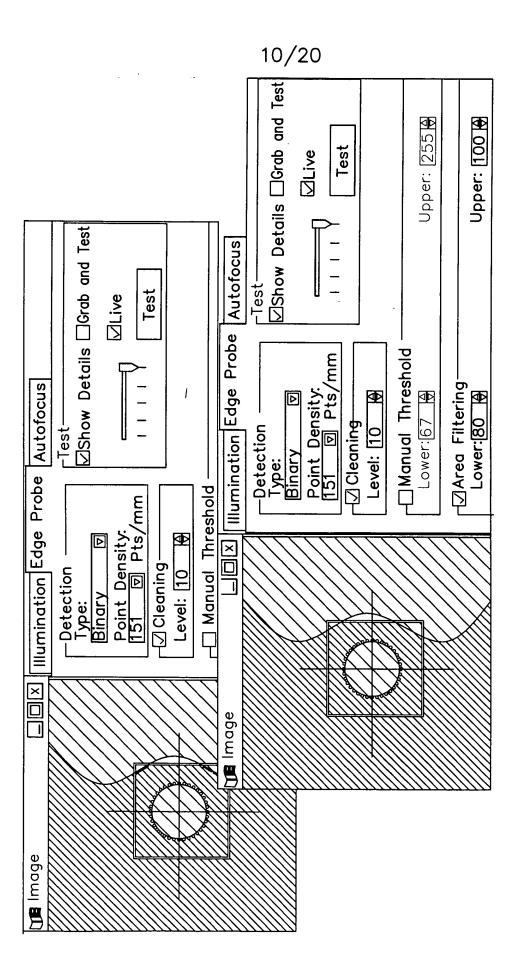
FIG. 5



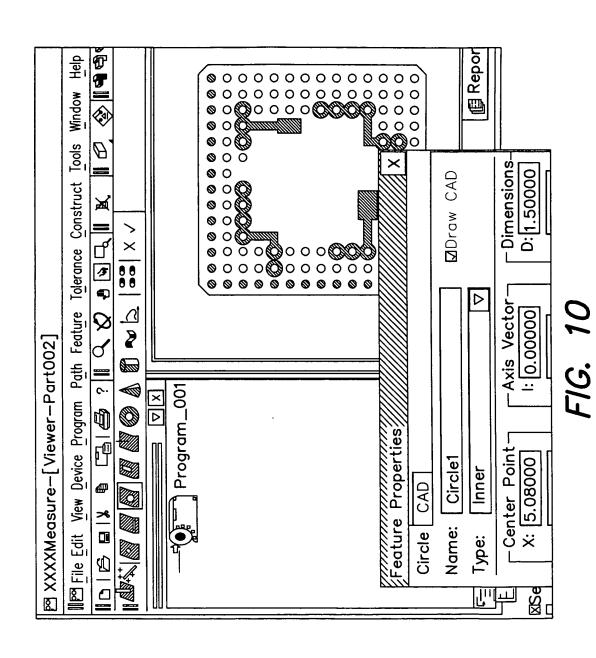
F/G. 6



F1G. 8



F/G. 9



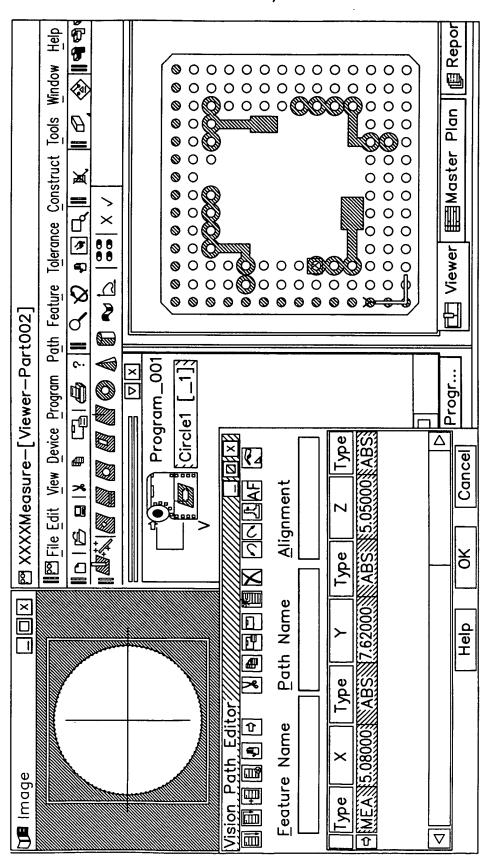


FIG. 11

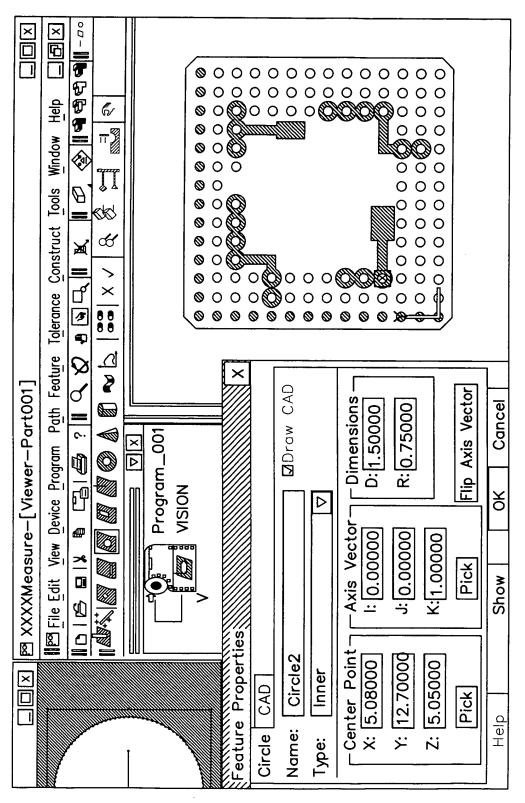


FIG. 12

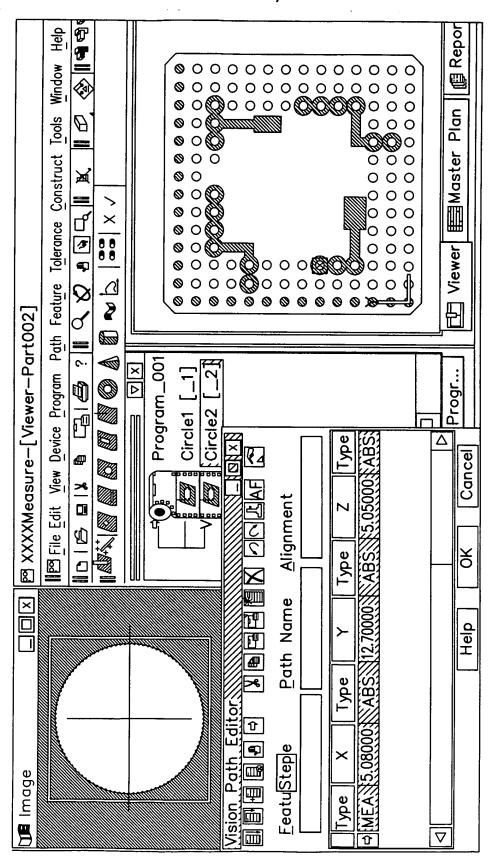


FIG. 13

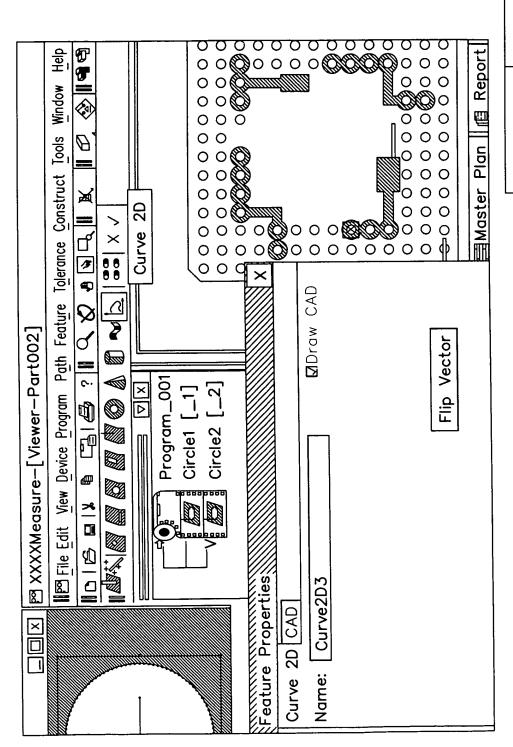
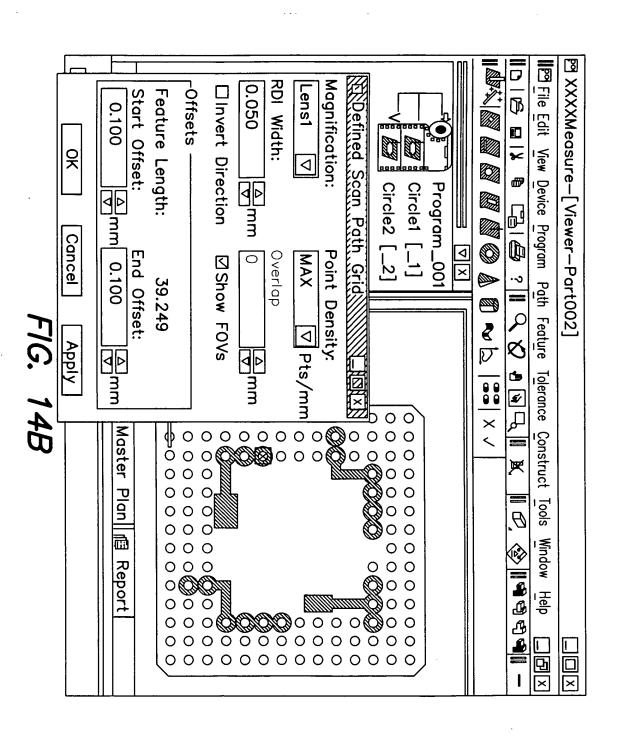


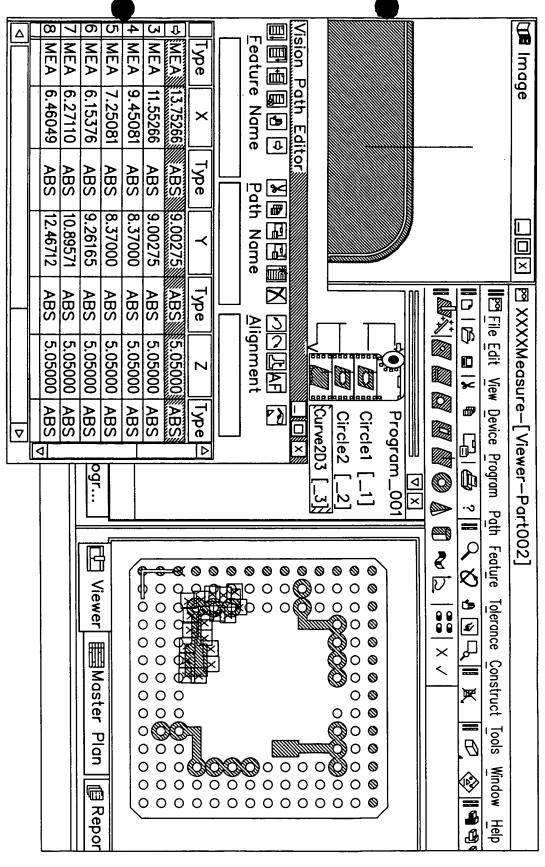
FIG. 14A

14A F1G.

FIG. 14B



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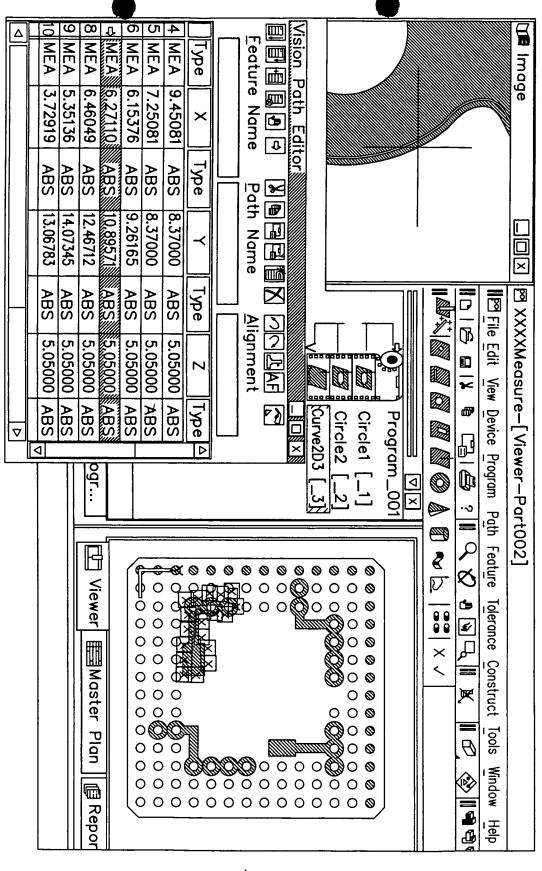


FIG. 16

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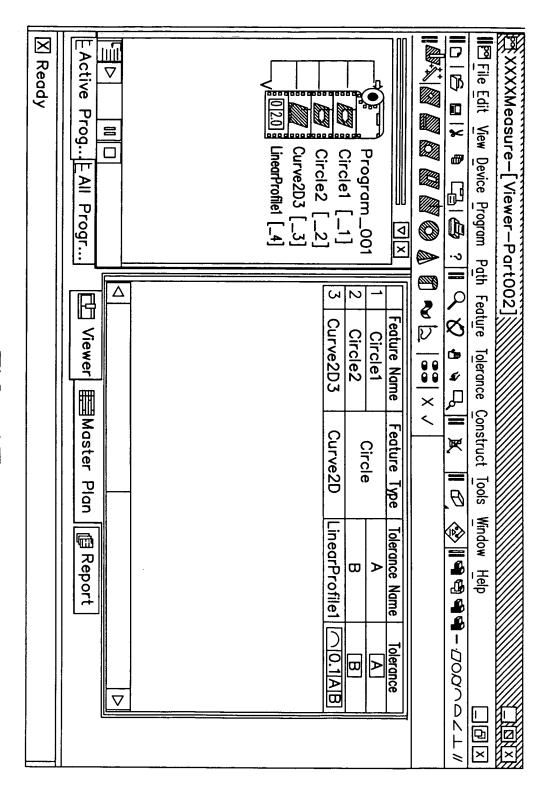


FIG. 17

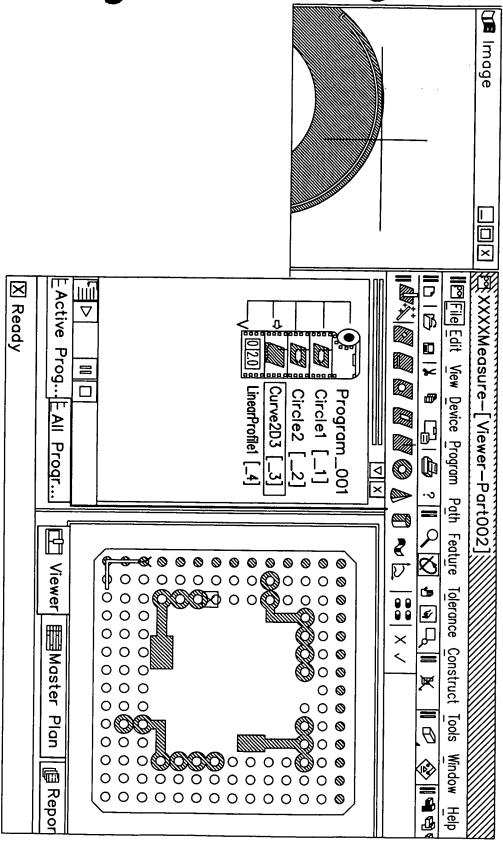


FIG. 18